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Cunningham, T. (2017) Valuing Variations in Accordance with the Principle Irish Standard Forms of Building Contract – Worked Examples and Solutions,

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VALUING VARIATIONS IN ACCORDANCE WITH THE PRINCIPLE IRISH STANDARD FORMS OF BUILDING CONTRACT – WORKED EXAMPLES AND SOLUTIONS

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Introduction

The general principles of contract law hold that once a contract has been entered into it cannot be changed or varied without the agreement of all the parties. However, given the nature of the construction process some change is almost inevitable. Standard forms of contract, therefore, cater for such change by including provisions which permit variations and alterations to the works.

Clause 2(a) of the Royal Institute of Architects in Ireland (RIAI) Contract authorises the architect to issue instructions regarding *‘the modification of the design, quality or quantity of the Works or the addition, omission or substitution of any work,’* that are referred to as ‘variations’. In addition, clause 2(i) of the RIAI contract authorises the architect to issue instructions on *‘any other matters appertaining to the proper execution of the Contract’* (RIAI, 2012). Taken together, these provisions may broaden the scope of variations to include both changes to the physical works *and* alterations to obligations and restrictions imposed upon the contractor in other elements of the contract documentation such as in the specification and/or bill of quantities.

The Public Works Contract Form PW-CF1 refers to variations as ‘change orders’. Clause 1.1, defines *‘Change Order’* as *‘an instruction of the Employer’s Representative to change [including add to or omit from] the Works or to change [including impose or remove] constraints in the Contract on how the Works are to be executed’* (Office of Government Procurement, 2017).

Even simple changes can have significant implications and can give rise to costs such as:

- Additional design work,

- Payment for aborted work and associated making good costs,
- Disposal of redundant items, potential restocking charges (where suppliers allow restocking)
- Cancellation of, or modifications to supply orders, loss of discount for large and scheduled orders.
- Delay in delivery of material to site.
- Delay and/or disruption of the building programme with consequent prolongation and loss and expense claims.
- Reprogramming of site works or acceleration of work into shorter periods with consequential additional overtime costs and loss of productivity.
- Extending the contract period and the associated contractual ramifications.

In isolation, variations are often dismissed as inconveniences and are commonly viewed as one of the normal problem areas involved in construction. However, cumulatively or where a series of interrelated or conflicting instructions arise, these may significantly delay or disrupt the building programme, and result in the contractor expending significant sums of money in reorganising and completing the contract. A common difficulty faced by contractors is successfully negotiating the reimbursement of these costs. The employer and consultants may think that the contractor is exaggerating the problem or is being unreasonable, and may dispute the details of the contractor's variation account.

Valuing Variations in Accordance with the principle Irish Standard Forms of Building Contract.

The following rules summarise the provisions of the RIAI and PW-CF1 forms of contract. The rules are considered in greater detail in a separate study by the author entitled *Managing Post Contract Variations under The Principle 'Traditional' Irish*

Forms of Contract - An Overview. <http://arrow.dit.ie/beschreoth/28/>. The rules themselves, are set out in the Appendix to this study.

The RIAI Contract where quantities form part of the contract (Yellow Form)

The rules for valuing variations are set out in Clause 13 of the RIAI Standard Form of Contract. In summary, valuations may be formulated:

1. *By Agreement:* The wording ‘*unless previously or otherwise agreed*’ in the RIAI Contract provides for the possibility of a separate agreement for valuing variations.
2. *Bill rates:* Where the variation involves work of a similar character which is carried out under similar conditions, then the valuation of the varied work is based on bill rates.
3. *Adjusted rates:* Where the variation involves work which is not similar insofar as it alters the specification, or involves working under different conditions, or changes the quantities significantly, then the applicable contract rate(s) may be adjusted in order to produce a ‘reasonable’ rate reflecting the additional or reduced cost of executing the varied work.
4. *Market rates:* Where appropriate rates do not exist in the bill, a *fair valuation* of the work should be made based on current rates for similar work in the locality. These rates can normally be obtained from bills of quantities for similar works and adjusted as appropriate. Price books such as *Spons Irish Construction Price Book* (2008) may also be consulted as a general reference in agreeing these rates.
5. *Dayworks:* Where the architect considers it inappropriate to value the varied works based on tendered rates, the work may be reimbursed on a dayworks basis. Dayworks are a method of paying for work based on the actual cost of labour, materials and plant used to carry out the works plus an allowance for on-costs to cover the contractor’s general overheads in performing the varied work.

6. *Omitted Work:* In general omitted work is valued at contract rates. However, if the omission is so extensive as to change the basic nature of the remaining work, then a fair valuation shall be made of the remaining works.

The Public Works Contracts

Section 10.6 of the Public Works Contract Forms deals with the valuation rules governing adjustments to the contract sum, these rules are included in the Appendix below. The rules are similar to those contained in the RIAI contract, discussed above, but there are subtle differences which reflect a greater emphasis on pre-costed contractor's proposals, and a more procedural approach to dealing with dayworks.

Adjusting Bill Rates

The pricing of variations often requires quantity surveyors to consider whether the varied work is similar in character, conditions and quantity to that contained in the bill of quantities or pricing document. Where this is not the case it usually becomes necessary to adjust bill rates in order to calculate a 'reasonable' or 'fair' price for the work.

It is important to understand that bill rates comprise a number of separate priced elements: labour, materials, plant, overheads and profit. In adjusting a bill rate the built-up rate is broken down (analysed) into its various cost components in order that it can be adjusted. Cartlidge (2016) recommends that it is better to build up a new rate from first principles if too many constituents of a rate have to be adjusted. He recommends the following approach for adjusting bill rates when valuing variations.

1. 'Deduct overheads and profit,
2. Analyse materials, labour and plant costs,
3. Adapt costs to suit new item
4. Add back overheads and profit.' (p. 425)

Example – An Introductory Exercise

A bill of quantities contains the following item:

12mm two coat plaster on block walls – 2,000m² @ €18¹ €36,000

What logic would be used by a quantity surveyor in determining appropriate rates for the following variations?

1. Add 200m² of 12mm two-coat plasterwork.
2. Add 200m² of 15mm two-coat rendering.
3. The architect has instructed the contractor to repair defective plastering in the existing building. The repairs were in small patches (typically not exceeding 1.0m²) and took place from time to time over a six-month period. The areas involved totalled 25m².
4. Omit 1800m² of 12mm two-coat plasterwork.

Part 1. - Increasing the quantity of work.

This variation is most readily valued by applying bill rates as the extra work is similar in character and appears to be executed under similar conditions to those of the ‘parent’ rate in the bill of quantities. The valuation therefore is **200m² @ €18.00**.

Part 2. - Substituting a related specification.

This variation is a different specification and therefore the work is of a different character but it may be seen as being carried out under similar conditions to that of the plastering rate in the bill. The originally billed and substituted work are, after all, both plastering activities. The valuation may therefore be attempted by adjusting the billed plastering rate. The revised rate could then be checked against current market rates or published

¹ *Spons Irish Construction Price Book* (2008) published rates for 13mm two coat plaster at €17.80 (inclusive of 10% overhead and profit) comprising net costs of €13.05 for labour and €3.13 for materials – a ratio approaching 80:20. *Spons* also reported net prices of €10.67 (€8.70:€1.97) and €16.08 (€13.05:€3.03) respectively for 12mm and 18mm thick cement and sand render. Although these rates are nearly 10 years old, as a result of the effects of the recession prices are only now approaching those of 2008. It is considered therefore that a rate of €18.00 is indicative of current plastering rates. It is also considered appropriate to use labour/materials ratios set out in *Spons* as the basis for carrying out this exercise.

prices to assess whether it is 'fair and reasonable'. The following example indicates how a bill rate might be adapted as a basis of the valuation.

Step 1. Deduct the overheads and profit included in BQ rate. (Finding the net rate)

Assuming that the overheads are 13% and the profit is 7%,

If $x + 0.13x + 0.07x = €18.00$ Therefore $1.20x = €18.00$

and $x = €18.00 \div 1.20 = \underline{\underline{€15.00}}$

Step 2. Analyse materials, labour and plant costs.

Assuming the breakdown of net rate

Materials 20% of €15.00 = €3.00

Labour 80% of €15.00 = €12.00

Plant Assumed hand-mixed – no plant required

Net Rate (above) = **€15.00**

Step 3. Adapt the net rate to suit new item.

Materials	$€3.00 \times [15 \div 12^2]$	€3.75
Labour:	$€12.00 \times [15 \div 12]$	€15.00
New net rate		<u>€18.75</u>

Step 4. Add back the overheads and profit.

² The rates for materials published in *Spons* would indicate that the material content for 15mm cement and sand render would be approximately €2.50. This is the same as that assumed in the analysis of the plaster rate. No adjustment is necessary, therefore, for the relative differences in material cost between the two specifications. An adjustment is, however, necessary for the differing thicknesses of the two specifications.

New net rate		€18.75
Overheads and profit	20% of €18.75	<u>€3.75</u>
Adjusted bill rate		<u>€22.50</u>

200m2 @ €22.50 a 'pro-rata' or adjusted bill rate.

Part 3. - Patching.

This is work of an ad-hoc nature and was work which was not included in the tender documents. Although 'patching' rates contained on other refurbishment projects may be tabled as a possible basis for agreement, it appears that dayworks would be the most appropriate method for valuing this type of work.

The valuation therefore is based on **dayworks rates**

Part 4. - Substantial omission of work.

Extensive omission of part of the work, fundamentally alters the basis on which the rates for the particular work items were tendered. Economies of scale are lost on reduced scope of works and fixed overheads associated with the work increase in proportion to the extent of the reduced work. The omissions may also change the conditions under which the work is carried out, for example, by losing continuity of work. In these instances the remaining work is treated as if it, in itself, is a variation. An adjustment such as that which follows may represent a **fair valuation** of the remaining works.

Omit Plasterwork 2000m2 @ €18.00 - €36,000.00

Add Plasterwork 200m2 @ €25.00 €5,000.00

It should be noted that a quoted or an agreed valuation may be made for any or indeed all of the illustrations.

Sample Questions

In answering the following questions assumptions should be stated which identify the issues and potential outcome situations. Where appropriate, answers should contain justification for proposals made.

Example 1: A Generic Variation Scenario.

Discuss the approaches that may be appropriate in valuing the following variations on billed work.

1. Due to design team error a reinforced concrete column has been cast in the wrong position and the contractor has been instructed to remove and replace it.
2. A section of concrete slab must be cut out because tests show unsatisfactory strength.
3. A design change necessitates an increase in 215mm thick block walls on the ground floor by one third.
4. Lift shaft walls on the roof of a tower block have been changed from reinforced concrete to brickwork; rates are agreed for brickwork on the ground floor.

Part 1. - Demolishing and reconstructing the column:

This situation is a change of the original design. It is therefore a variation, which will be valued in accordance with the contract provisions. The contractor will be reimbursed for the following:

- The price of the original work at the rates contained in the bill of quantities / pricing document.
- The cost of demolishing the affected completed work and making good; as this is unplanned work of an 'ad-hoc' nature the valuation will probably be based on daywork accounts.

- The cost of the remedial work. It is unlikely that the remedial work can be carried out as originally planned (executed under similar conditions). The works are likely to be out of sequence and will probably involve return visits of a number of trades. The contractor is likely to seek a dayworks valuation for these works. It is unlikely that an attempt to value the remedial work by adjusting bill rates to reflect the reduced productivity would produce a 'fair' valuation in these circumstances.
- Loss and expense suffered by the contractor should the remedial works delay completion of the contract or disrupt other site operations. Delay costs are usually valued as a prolongation claim based on the time-related items included in the contract preliminaries. Disruption claims must be proved and consequent costs are likely to be based on daywork accounts. On public works contracts the use of the Programme Contingency would be applied in these circumstances.

Part 2. - Condemned work.

This work is not in accordance with the contract documents and therefore is not a variation. This work must be cut out and replaced by the contractor at his own expense. In addition, the contract must be completed within the original contract period.

Part 3. - More walls on the ground floor.

On the face of it, this instruction is for additional work which is of a similar character and is executed under similar conditions to that described in the contract, i.e. the description of the additional work, measured in accordance with ARM4, is the same as that described in the bill of quantities. The variation would, therefore, be valued at contract rates. (Note, the word similar does not mean identical and it is a matter of judgement to assess whether the conditions are, in fact, similar).

The extent of the change, however, begs the question, when do the characteristics and/or conditions under which the works are executed cease to be 'similar' to those described in the contract? If the blockwork is confined to the ground floor, it may be argued that the

instruction brings about a substantial increase in the scope of the works. 'Boundary disputes' are common in many areas of life and a consultant QS might argue that the variation should result in savings in the blockwork rates due to increased economies of scale, while a contractor may argue that the increased work scope has implications for preliminaries costs which should be reimbursed. Each situation must be judged individually on the particular facts.

Part 4. - Substitute brick for reinforced concrete walls.

This instruction is for substituted work which is **not executed** under similar conditions to those envisaged in the contract and should therefore be valued at a fair/reasonable rate using the rates for the ground floor brickwork as the basis of the valuation.

The concrete construction is omitted at bill rates. The rates for the brickwork should take account of the changed conditions affecting its execution. This involves work on the **tower block roof** rather than ground floor and involves additional time to get labour and materials to and from the work station. The work is also confined and in a small area rather than the probable large areas at ground level. Similarly the work is executed out of sequence and will probably require a return set up on site. The work is exposed at height to the elements and may require special scaffolding.

Example 2 Variations under the RIAI Contract.

Explain how the following changes are valued under the RIAI Standard Form of Contract (assume a 65 week contract).

- a) The tiles for the kitchen and toilet areas are to be supplied by a nominated supplier. They are ordered for delivery to site during week 58 and are programmed to be fixed during weeks 61 and 62. Upon delivery, the tiles are found to be have been incorrectly dispatched by the nominated supplier, and can only be replaced during week 63.
- b) The contract is on programme at week 58 with all the internal doors fixed. The Architect issues an instruction to remove a number of the corridor doors and frames and replace them with acoustic door sets. Delivery of these units is quoted as 14 weeks.
- c) An Architect's Instruction issued during week 65 requested the addition of specialist fire protection to the boiler room, this work will take three weeks to carry out.

Part A. - The wrong tiles arrive on site.

In this case there is no variation. The materials delivered are, in fact, not in accordance with the contract specification (clause 8). The architect can insist on the correct tiles and issue an instruction ordering the wrong tiles to be removed from site and to be replaced with the correct tiles (clause 2). In this event, the contractor must comply with the instruction and suffer any extra costs incurred in resupplying the tiles. The contractor is also responsible if this problem delays handover of the works. There is no provision in the RIAI contract to extend the completion period for delay by nominated subcontractors or suppliers. The employer may become entitled to deduct liquidated damages should the contractor fail to complete on time. The contractor will have to recover any losses from the nominated supplier who is ultimately responsible for the additional costs caused by this blunder.

A more pragmatic solution however would be to approve the tiles which although incorrect may be 'suitable'. In this case the architect may exercise his discretion to

approve the tiles. Alternatively, the contractor may propose another type of tile which satisfies the architect. This has the practical advantage of allowing the works to be completed on time. It does, however, constitute a variation because it modifies the works. It is likely for a credit to be sought where the substitute tile is accepted as being 'expedient' in order to compensate the client for possible loss of amenity. Where the contractor proposes a superior tile specification, however, the client would not expect to be charged extra, as the substitute tile has been proposed in order to solve the contractor's own difficulties.

Part B. - Replacement acoustic doorsets to the corridor.

This is a substitution of the contract works and is a variation under clause 2 of the RIAI contract and is consequently valued under the provisions of clause 13 of the contract. The evaluation of the variation presents a number of issues:

- **Abortive work.** The contractor will be paid for doorsets which have already been fixed on site at bill rates. This valuation would include other associated works such as fixings, ironmongery, glazing and painting.
- **Removal of abortive work.** The contractor will be reimbursed for the cost of removing the doors and frames and making good any finishes on a dayworks basis. Although unlikely, the 'redundant' doorsets may have some value to the contractor and some credit could be obtained. Otherwise, they must be disposed of and the contractor will be reimbursed for the disposal costs.
- **Substituted work.** Acoustic doors cost considerably more than standard flush doors. It is assumed there are no acoustic doors required elsewhere on the project and, therefore, there are no rates for them in the bill of quantities. There may be a temptation to attempt to value this instruction on the basis of interpolating rates for acoustic doors on other projects. This may present problems, as acoustic doors are not required on many projects, and therefore, the QS may not have an adequate database on which to base a reliable valuation. In addition, acoustic

doors are often installed by firms specialising in this type of work, and it may be that the architect may insist on a specialist to carry out the work.

Given the specialist nature and the urgency of these works it is likely that a price, based on a specialist's quotation would be negotiated and agreed. This may well be on the basis of dayworks if no agreement can be reached beforehand. If it is decided to appoint a nominated subcontractor to carry out the work, the contractor will be entitled to add for profit, and the cost of any additional special attendance provided to the nominated sub-contractor.

- **Programme effects.** The delivery period for the acoustic doorsets is 14 weeks meaning that they will be delivered in week 72, seven weeks after the scheduled contract completion. This will delay handover by at least these seven weeks plus the additional time taken to install the replacement doors and complete any follow-on and tidy-up activities. The architect and contractor will, no doubt, urge the nominated sub-contractor to prioritise the work in order to minimise the eventual delay.

The contractor should, nevertheless, immediately apply for an extension of time and advise the architect that this instruction will cause loss and expense due to the delayed completion and disruption of the programmed works. The contractor must document how the variation impacts on the programme. Items which would be affected would include site management, site accommodation, standing plant, etc. The client may well wish to minimise the costs of the delay by agreeing to pay for accelerating the contractor's progress once the doorsets have been delivered. The contractor will seek to be reimbursed for the cost of non-productive overtime and the additional costs associated with the accelerated and disrupted work and will need to carefully record these details in order to formulate the financial claim.

- **Alternative proposals, agree to a retrofit.** Because of the potential serious delay posed by the long lead-in time, the client may prefer to finish out and complete the contract as originally planned and subsequently retrofit the acoustic doorsets,

following handover of the building. This approach would, however, require a new contract to be negotiated and the original bill rates would no longer apply.

The scope of the works would include removing the original doorsets and ancillary works, making good, and replacing with the acoustic doorsets. These works could be done while the building is operational, in accordance with an agreed programme, perhaps over weekends or at night to minimise disruption. Despite the premium which is likely to be paid for this arrangement, it may nevertheless, be a more economic option than reimbursing the contractor's prolongation / disruption claim for being prevented from completing on time.

Part C. - Fire protection to the boiler room

This work must be carried out before the project is handed over for safety reasons! The instruction brings about a variation under clause 2 which is to be valued in accordance with clause 13. The scenario indicates an emergency situation where there will be no time to 'shop around' before making an appointment. As the work is of a specialist nature, the architect would typically nominate a particular subcontractor to carry out these works. The contractor may propose suitable firms in making this appointment.

The valuation of this variation will be by agreement, as there are no applicable rates included in the bill, nor is it likely that reliable rates could be interpolated from rates on 'local' projects. Ideally the price will be agreed before the work commences, but given the ad-hoc scenario this is more likely to be agreed on completion of the works on the basis of dayworks. Emergency works by specialists can be expected to cost considerably more than routine operations. The contractor will be entitled to add for profit and any additional special attendance on the nominated subcontractor's work.

The fire protection work will, no doubt, delay the handover of the building. The contractor will therefore become entitled to an extension of time for the delay caused by this instruction. The contractor will be entitled to claim prolongation costs arising as a result of the extended duration on site. There may also be disruption costs associated with the works.

Example 3. Variations under the Public Works Contract

Explain the provisions of the Public Works Contract PW-CF 1 to value the following change orders: (assume an 80 week-contract)

- a. A significant part of the softwood skirting and architraves have been fixed when the Employer's Representative issues an instruction to omit softwood skirting and substitute these with hardwood.
- b. The contract is on programme at week 74. The internal plastering has been completed when the Employer's Representative issues an instruction to take out the double glazed aluminium windows to the west elevation and substitute them with triple glazed units. Delivery of these units is quoted as 10 weeks
- c. Add sound deadening quilt above the suspended ceilings of the ground floor. Instruction issued during week 78.

Part A. - Change the skirting specification.

Part a, is a variation and will be the subject of a change order issued by the employer's representative. The contractor will be paid for the softwood skirting and architraves which have already been fixed in position *at rates contained in the pricing document*. It is assumed that the skirting has not been painted at this stage and that architraves will not need to be taken down. This change order requires the accurate measurement of the quantity of softwood skirting fixed on site in order to agree the quantum involved with the contractor.

The contractor will also be paid the cost of removing the original skirting, plus the cost of any consequential making good of finishes. It is very unlikely that there will be rates covering this type of work in the pricing document and it would be considered inappropriate to use tendered rates on other (refurbishment) projects as the basis of for valuing this unplanned work. The cost of the work involved in removing and disposing of the skirting should, therefore, be valued on the basis of invoiced dayworks.

Regarding unfixed softwood skirting, the contractor should immediately cancel any outstanding deliveries. Any unfixed skirting included in previous certificates has already been paid for, and is now the client's property. It is possible, however that further deliveries of softwood skirting have been made since the previous certificate; the employer's representative has the discretion to pay for these unfixed materials but is *not obliged* to include them in the next interim certificate. The contractor will, nevertheless, be instructed to remove the unfixed softwood skirting from site and is expected to use best efforts in order to minimise the additional expense involved. The contractor may be able to return them to the supplier, but this will probably incur restocking charges. There is also a slight possibility that the contractor may be able to use the materials on other sites, and if so, the consultant QS will seek to ensure that any credit from restocking or their use on other sites is passed on to the client.

The valuation of the substitution of hardwood in lieu of softwood is relatively straightforward and may be deduced by adjusting the softwood rates in the bills of quantities. Assuming the cross section of the skirting does not change, the bill rate for the skirting will be increased to account for the following:

- The extra cost of the hardwood over and above that of the softwood. This involves subtracting the basic cost of the softwood from hardwood.
- The additional labour required to fit hardwood in lieu of softwood. This involves comparing the labour constants for fixing hardwood and softwood. This is then multiplied by the all-in rate per hour for carpenters.
- It is assumed in this instance that this variation can be completed without delaying completion of any critical activities and that the preliminaries costs are not impacted.

Part B. - Substitute triple glazed windows for double glazed windows.

It should be noted that P.C. Sums are not accommodated on public works contracts and that 'reserved specialists' are employed by the contractor on a 'domestic' basis. The

contractor will be paid for the work properly carried out at the date of the employer's representative's instruction.

- **Abortive work.** It is assumed that original double glazed window frames cannot accommodate the extra thickness of the triple glazing and, therefore, will effectively become scrap. Any credit which can be obtained for these will be taken into account. The cost of removing and disposing of the windows and making good any structural work or finishes will be the subject of a daywork account as in part (a) above.
- **Replacement windows.** Although time is pressing, the contractor may be directed by the employer's representative to prepare a proposal detailing the financial and programme implications of the instruction. If accepted, the proposal will be paid as a lump sum adjustment to the account.

In any event, the selected window sub-contractor's quotation/account is likely to form the basis by which the valuation is assessed. The quotation/account may contain a breakdown containing little more than a rate for supplying and fixing each window type. The replacement windows will often be (considerably) more expensive than the original and may take longer to fit. These costs will have to be negotiated and agreed with the contractor. Reference may be made to the rates for the original double glazed windows or to rates for triple glazed windows on other comparable projects, but the unplanned ad-hoc nature of the revision and the limited quantities involved, fundamentally changes the nature of the pricing of this work, and the valuation by dayworks therefore can be justified. It would also be unusual for the consultant QS to have a sufficiently detailed database on which to reliably challenge the *bona fides* of the valuation, but it is nevertheless likely some degree of compromise will be achieved in settling the valuation.

- **Prolongation Costs.** A Change Order is regarded as both a Delay Event and a Compensation Event under the PW-CF1 form of contract. The delivery period for the windows is 10 weeks. This means that the replacement windows will be delivered in week 84 - four weeks after the original contract Date for Completion.

There will be additional delays associated with the window installation and consequent finishing up process. The contractor will be entitled to apply for the use of the Programme Contingency or to seek an extension of time where the Contingency has been exhausted.

The contractor will *not* be paid any delay costs until the first threshold of the Programme Contingency has been exhausted. The contractor will be paid half of his tendered daily rate for delay where the delay exceeds the first, but not the second threshold of the Programme Contingency. When the Programme Contingency has been entirely exhausted, the contractor will be paid his full daily rates tendered for the remaining period of the delay.

The contractor must comply with all notice and information required by the contract and demonstrate the effects of the instruction by reference to the programme. As the contractors have included daily rates for delays in their tenders, these rates will form the basis for calculating damages should the delay(s) exceed the Programme Contingency first and second thresholds.

There is little doubt that some (considerable) pressure will be exerted on the contractor and window subcontractor to prioritise the delivery of the windows in order to enable the project to be completed within the original schedule and to avoid the need for retrofitting works. The client may agree to pay for accelerating the contractor's progress in this instance. The additional cost of overtime, shift work and the increased subcontract charges involved will need to be carefully recorded in order to evaluate this instruction.

Part C. - Late instruction: install sound insulation in the corridors

This instruction has been ordered very late in the contract programme and is targeted at corridors areas that are likely to be very busy during this crucial period immediately preceding handover. The proposed work therefore has the potential to be highly disruptive and, as such, is likely to cost (significantly) more than similar work carried out as part of a planned programme of works.

Installation of the insulation will require the lifting and/or removal of some or all of the ceiling panels/sheeting and its supporting framework. The cost of carrying out this unplanned preparatory work and replacing it on completion will be valued on a daywork basis.

Although no rates for the sound deadening quilt are contained in the bill of quantities, it is an item which is included in many commercial and educational projects. In normal circumstances it would be appropriate to value these works by agreeing a 'fair rate' based on rates for similar work in the locality. However, in the current 'emergency' scenario, it is clear that 'normally tendered' rates for insulation are unlikely to form the basis of an agreed settlement, particularly if the work has been carried out at night or over weekends. The valuation of the insulation, therefore, is also likely to be claimed, and most probably settled, based on dayworks.

As noted above, the instruction may cause (considerable) disruption of the contractor's completion activities. It may also delay handover of the building. In the event of delay, the contractor will be entitled to seek a use of the Programme Contingency or to seek an extension of time if the Contingency has been exhausted. Additional costs arising from the disruption of the contractor's work, however, are not reimbursed separately, but instead, are incorporated in the daily rates tendered for Compensation Events by the contractor in competing for the project.

Supplemental Discussions

Exercise 1

During a contract, the client requests the contractor to change the floor finishes in various areas. Explain how the provisions of the RIAI form of contract would be applied to value such changes.

Exercise 2

Apply the provisions of the RIAI contract to value the following architect's instructions

1. Delete all internal plastering to concrete blockwork in the staircase areas and substitute with fair faced blockwork.
2. Omit hardwood joinery and add softwood at all apartments.
3. Add a single storey lobby at ground floor to each block.
4. Add a detached 12 bin store lockup.

References

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Office of Government Procurement (2017), *Public Works Contract for Building Works Designed by the Employer PW-CF1 v.2.2 09 January 2017*, Department of Public Enterprise and Reform, Dublin

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APPENDIX

Text of Clause 13 of the RIAI Contract Regarding the Valuation of Variations

...in respect of such variations and the valuation thereof unless previously or otherwise agreed shall be made in accordance with the following rules:

(a) The rates in the Bill of Quantities referred to in section (i) of sub-clause 3(a) or the Schedule of Rates mentioned in section (ii) of sub-clause 3(a) of these Conditions whichever applies to this Contract shall determine the value of work carried out as a variation where such work is of a character similar to that to which the aforesaid rates apply and is carried out under similar conditions. The aforesaid rates shall also determine the value of any work omitted provided that if in the opinion of the Architect such an omission varies the conditions under which any remaining items of work are carried out such remaining items shall also be deemed to be varied and shall be valued under rule (b) hereof.

(b) The said rates where variations are not of a similar character or executed under similar conditions as aforesaid shall be the basis of prices for the same so far as may be reasonable; failing which a fair valuation thereof shall be made based upon rates for similar work in the locality current at the time the variations are executed.

(c) Where in the opinion of the Architect variations cannot properly be measured and valued in the manner set out in rule (a) or rule (b) the Contractor shall be allowed daywork prices:

i) at the rates in any in the Bill of Quantities referred to in Section (i) of sub-clause 3(a) or in the Schedule of Rates referred to in Section (ii) of sub-clause 3(b) as the case may be; or

ii) where no such rates have been inserted at the rates in the Schedule of Daywork Charges agreed between the Society of Chartered Surveyors in the Republic of Ireland and the Construction Industry Federation and approved by the Royal Institute of the Architects of Ireland and current at the time the work is carried out; or

iii) where the work has been executed by a member of a sub-contracting trade at the rates agreed between the said Society and the appropriate body representing the sub-contracting trade or, where no such rates have been agreed, at the rates set out in Section (i) of this rule

Text of Clause 10.6 of the Public Works Contract Regarding the Valuation of Variations

Adjustments to the Contract Sum for a Compensation Event shall only be for the value of any additional, substituted, and omitted work required as a result of the Compensation Event under this sub-clause 10.6 and any delay cost under sub-clause 10.7. Additional, substituted, and omitted work shall be valued as follows:

10.6.1 If the Compensation Event requires additional, substituted or omitted work, similar to work for which there are rates in the Pricing Document, to be executed under similar conditions, the determination shall use those rates.

10.6.2 If the Compensation Event requires additional, substituted or omitted work that is not similar to work for which there are rates in the Pricing Document, or is not to be executed under similar conditions, the determination shall be on the basis of the rates in the Pricing Document when that is reasonable.

10.6.3 If the adjustment cannot be determined under the above rules, the Employer's Representative shall make a fair valuation based on rates for similar work in the locality, if available.

10.6.4 Instead of sub-clauses 10.6.1, 10.6.2 and 10.6.3 applying, the Employer's Representative may conclusively direct that additional or substituted work required as a result of a Compensation Event be determined (in full or in part) on the basis of the cost of performing the additional or substituted work, compared with the Contractor's cost without the Compensation Event, determined as follows:

(1) the number of hours worked or to be worked by each category of work person stated in the Schedule, part 2D, and engaged on the work to which the Compensation Event relates, on or off the Site, multiplied in each case by the tendered hourly rate for that category stated in the Schedule, part 2D (But if any of the tendered hourly rates are less than 75% of the relevant rate (in the case of Craftspersons this means 75% of the Craftsman's rate, or in the case of General Operatives, 75% x 88% of the Craftsman's rate, or in the case of Apprentices, 75% x 62% of the Craftsman's rate) in the construction industry registered employment agreement current on the Designated Date, they will be read instead as 75% of the relevant rate in that agreement (in the case of Craftspersons this means 75% of the Craftsman's rate, in the case of General Operatives, 75% x 88% of the Craftsman's rate, in the case of Apprentices, 75% x 62% of the Craftsman's rate)) and

(2) the cost of materials used in that work, taking into account discounts and excluding VAT, plus the percentage adjustment tendered by the Contractor and stated in the Schedule, part 2D (But if the percentage adjustment tendered is negative or blank it will be read as 0%) and

(3) the cost of plant reasonably used for that work, whether hired or owned by the Contractor, at the rates in the document listed in the Schedule, part 1K (as that document

may be modified according to the Schedule, part 1K) plus or minus the percentage adjustment tendered by the Contractor and included in the Schedule, part 2D (But if the percentage adjustment tendered is a deduction of more than 100% it will be read as a deduction of 100% or if the entry is blank it will be read as 0%). If the document listed in the Schedule does not give a rate for a plant item, a market rental rate shall be used, plus or minus the percentage adjustment.